

CLAIMS

We claim:

1. A method of exchanging gases in a light source comprising a hollow tube having a first end and a second end with a first endcap at the first end and a second endcap at the second end, a first valve associated with the first end to allow one or more gases to flow into the hollow tube and a second valve associated with the second end to allow the gas or gases within the tube to be removed from the tube, the method comprising:

opening the first and second valves;  
pumping a first gas initially located within the light source out of the light source through the second valve;  
pumping a second gas into the light source through the first valve; and  
closing the first and second valves.

2. The method of Claim 1, wherein the first gas is selected from the group consisting of: inert gases, krypton, argon, neon, xenon, helium, mercury, neon/helium mixture, neon/argon mixture, oxygen, hydrogen, deuterium, and nitrogen.

3. The method of Claim 1, wherein the second gas is selected from the group consisting of: inert gases, krypton, argon, neon, xenon, helium, mercury, neon/helium mixture, neon/argon mixture, oxygen, hydrogen, deuterium, and nitrogen.

4. The method of Claim 1, wherein the first gas is selected from the group consisting of: inert gases, krypton, argon, neon, xenon, helium, mercury,

neon/helium mixture, neon/argon mixture, oxygen,  
hydrogen, deuterium, and nitrogen; and the second gas is  
selected from the group consisting of: inert gases,  
krypton, argon, neon, xenon, helium, mercury,  
5 neon/helium mixture, neon/argon mixture, oxygen,  
hydrogen, deuterium, and nitrogen.

5. The method of Claim 1, wherein the valves  
include seals to prevent gas from leaking past or  
10 through the valves from the tube.

6. The method of Claim 1, wherein the light  
source is a straight light source.

15 7. The method of Claim 1, wherein the light  
source is a serpentine light source.

8. The method of Claim 1, wherein the light  
source is a lamp array of serially connected light  
20 sources.

9. The method of Claim 1, wherein the light  
source is a rectangular planar light source.

25 10. The method of Claim 1, wherein the light  
source is a spiral light source.

11. The method of Claim 1, wherein the light  
source is a ring light source.

30 12. The method of Claim 1, wherein the light  
source is a channel light source.

13. A method of exchanging gases in a light source comprising:

- opening a first valve of the light source;
- opening a second valve of the light source;
- 5 pumping a first gas initially located within the light source out of the light source;
- pumping a second gas into the light source; and
- closing each valve of the light source.

- 10 14. The method of Claim 13, wherein the first gas is selected from the group consisting of: inert gases, krypton, argon, neon, xenon, helium, mercury, neon/helium mixture, neon/argon mixture, oxygen, hydrogen, deuterium, and nitrogen; and the second gas is
- 15 selected from the group consisting of: inert gases, krypton, argon, neon, xenon, helium, mercury, neon/helium mixture, neon/argon mixture, oxygen, hydrogen, deuterium, and nitrogen.

- 20 15. The method of Claim 13, wherein the light source is a straight light source.

- 25 16. The method of Claim 13, wherein the light source is a serpentine light source.

17. The method of Claim 13, wherein the light source is a lamp array of serially connected light sources.

- 30 18. The method of Claim 13, wherein the light source is a rectangular planar light source.

19. The method of Claim 13, wherein the light source is a spiral light source.

20. The method of Claim 13, wherein the light source is a ring light source.

5 21. The method of Claim 13 wherein the light source is a channel light source.

22. The method of Claim 13, wherein the valves are open/close valves.

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23. A multi-spectral light source comprising:  
a hollow vessel with a first end and a second end;  
a first valve located at the first end;  
a second valve located at the second end;  
15 an electrode located at each end; and  
a pump for pumping a gas into and out of the vessel.

24. The light source of Claim 23, wherein the  
20 vessel is a tube.

25. The light source of Claim 23, wherein the gas is selected from the group consisting of: inert gases, krypton, argon, neon, xenon, helium, mercury,  
25 neon/helium mixture, neon/argon mixture, oxygen, hydrogen, deuterium, and nitrogen.

26. The light source of Claim 24, wherein the tube is a straight tube.

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27. The light source of Claim 24, wherein the tube is a serpentine-shaped tube.

28. The light source of Claim 24, wherein the tube is a plurality of serially connected individual straight tubes.

5 29. The light source of Claim 24, wherein the tube is a rectangular-shaped planar tube.

30. The light source of Claim 24, wherein the tube is a spiral-shaped tube.

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31. The light source of Claim 24, wherein the tube is a ring-shaped tube.

15 32. The light source of Claim 24 wherein the tube is a channel-shaped tube.